



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,961	06/21/2006	William Wadsworth	1034279-000022	7389

21839 7590 11/27/2009  
BUCHANAN, INGERSOLL & ROONEY PC  
POST OFFICE BOX 1404  
ALEXANDRIA, VA 22313-1404

EXAMINER
----------

STAFFORD, PATRICK

ART UNIT	PAPER NUMBER
----------	--------------

2828

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

11/27/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/583,961	<b>Applicant(s)</b> WADSWORTH, WILLIAM	
	<b>Examiner</b> PATRICK STAFFORD	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

Art Unit: 2828

## **DETAILED ACTION**

### ***Response to Amendment***

Claims 21-40 currently pending in application.

Claims 21 and 40 amended 30 July 2009.

### ***Response to Arguments***

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21, 24-34, 36, 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Town et al ("Optical Supercontinuum Generation from Nanosecond Pump Pulses in an irregularly microstructured air-silica optical fiber", hereafter "Town") in view of Birks et al (U.S. Patent Application Publication 2002/0122644, hereafter '644).

Claim 21: Town teaches a source of light of a spectrum of wavelengths extending over more than 300 nm (Fig. 2 and Fig. 3 showing spectrum of wavelengths extending over more than 300 nm), the source comprising:

Art Unit: 2828

a laser (page 235, second column, last paragraph, lines 2-5 and Fig. 2, part “Q-switched Nd:YAG laser”), which operates at or near its fundamental wavelength (page 235, second column, last paragraph, lines 2-5 and Fig. 2, part “Q-switched Nd:YAG laser” operating at 1.064  $\mu\text{m}$ ) and produces pulses of a duration longer than 0.5 ns (page 235, second column, last paragraph, lines 2-5); and

a micro-structured optical fiber arranged to guide the pulses (page 235, second column, last paragraph, line 8- page 236, second column, first paragraph, line 5 and Fig. 2, part “2m microstructured fiber), wherein the light is generated by the pulses in the core (pages 236, second column, second paragraph, lines 6-11 and Fig. 3), in which the microstructured fiber has a diameter greater than 4 microns (page 235, second column, second to last paragraph, lines 1-4 and Fig. 1) and the core has a diameter of a few microns (page 235, second column, second to last paragraph, lines 9-11 and Fig. 1).

Town does not explicitly teach the microstructured fiber has a core having a diameter greater than 4 microns and more than 80% of the light of the spectrum of wavelengths is in the lowest order transverse mode supported by the fiber. However, ‘644 teaches an optical fiber with a core having a diameter greater than 4 microns (paragraph 87, lines 8-10) being pumped by laser pulses (paragraph 86, lines 5-7) and inherently resulting in more than 80% of the light of the spectrum of wavelengths is in the lowest order transverse mode supported by the fiber, since the fiber is a single mode fiber (paragraph 87, lines 8-10) in order to transmit higher power radiation while maintaining single mode propagation (paragraph 11, lines 1-4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

Art Unit: 2828

have a fiber with a core having a diameter greater than 4 microns and more than 80% of the light of the spectrum of wavelengths is in the lowest order transverse mode supported by the fiber.

Claim 24: Town and '644 teach the source claimed in claim 21. Town teaches the pulses of light are of a duration of more than 1 ns (page 235, second column, last paragraph, lines 2-5).

Claim 25: Town and '644 teach the source claimed in claim 21. Town teaches the pulses have a peak power of less than 50 KW (page 235, second column, last paragraph, lines 2-5 and Fig. 3).

Claim 26: Town and '644 teach the source claimed in claim 21. Town teaches the pulses have a peak power and interact with the fiber over a length of the fiber such that the peak power times the interaction length is less than 2 kWm (Table 1, lines 5 and 6).

Claim 27: Town and '644 teach the source as claimed in claim 21. Town teaches the spectrum extends over more than 500 nm (Figure 3, extending over 1200 nm).

Claim 28: Town and '644 teach the source as claimed in claim 21. Town teaches the fundamental wavelength is longer than 600 nm (page 235, second column, last paragraph, lines 2-5, wherein the fundamental wavelength is 1060 nm).

Claim 29: Town and '644 teach the source as claimed in claim 21. Town teaches the fundamental wavelength ranges from about 1000 nm to 1100 nm (page 235, second column, last paragraph, lines 2-5, wherein the fundamental wavelength is 1060 nm).

Claim 30: Town and '644 teach the source as claimed in claim 21. Town teaches the micro-structured optical fiber has a zero dispersion wavelength  $\lambda_0$  and the operating wavelength of the laser is less than the zero dispersion wavelength (Table 1, lines 3, 5-6).

Art Unit: 2828

Claim 31: Town and '644 teach the source as claimed in claim 21. Town teaches the micro-structured optical fiber has a zero dispersion wavelength  $\lambda_0$  and the operating wavelength of the laser is greater than the zero dispersion wavelength (Table 1, lines 7-10).

Claims 32 and 39: Town and '644 teach the source as claimed in claim 29. Town teaches the micro-structured optical fiber has a zero dispersion wavelength  $\lambda_0$  (Table 1, lines 3, 5-10). It does not explicitly teach the zero dispersion wavelength between 1000 nm and 1100 nm.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the zero dispersion wavelength be between 1000 nm and 1100 nm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claim 33: Town and '644 teach the source as claimed in claim 21. '977 teaches the micro-structured optical fiber is arranged to support propagation of the pulses in a single transverse mode (paragraph 11).

Claim 34: Town and '644 teach the source as claimed in claim 33. Town teaches the micro-structured optical fiber is arranged to support propagation of light at all wavelengths (Fig. 3).

Claim 36: Town and '644 teach the source as claimed in claim 21. '644 teaches the micro-structured fiber includes a core having a diameter greater than 4.5 microns (paragraph 87, lines 8-10).

Claim 38: Town and '644 teach the source as claimed in claim 21. '644 teaches the micro-structured fiber includes an effective nonlinear area greater than  $8 \mu\text{m}^2$  (paragraph 5, lines 1-3, wherein the diameter is  $75 \mu\text{m}$  and the area is  $\pi(75 \mu\text{m}/2)^2=4415.625 \mu\text{m}^2$ ).

Art Unit: 2828

Claims 22-23, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Town et al (“Optical Supercontinuum Generation from Nanosecond Pump Pulses in an irregularly microstructured air-silica optical fiber”, hereafter “Town”) in view of Birks et al (U.S. Patent Application Publication 2002/0122644, hereafter ‘644) and further in view of Lam et al (U.S. Patent Application Publication 2004/0017977, hereafter ‘977).

Claims 22 and 40: Town and ‘644 teach the source claimed in claim 21. They do not explicitly teach the laser is a monolithic laser. However, ‘977 teaches a monolithic laser (paragraph 39, lines 3-9 and Fig. 1A, part 100) used to pump a fiber with a large core diameter (paragraph 39, lines 3-9) as a suitable pump laser. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a monolithic laser as a pump laser.

Claim 23: Town, ‘644 and ‘977 teach the source claimed in claim 22. ‘977 teaches the monolithic laser is a microchip laser (paragraph 40, lines 5-8 and Fig. 1A, part 100, wherein part 100 is a laser formed as a microchip to be bonded onto substrate 103).

Claims 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Town et al (“Optical Supercontinuum Generation from Nanosecond Pump Pulses in an irregularly microstructured air-silica optical fiber”, hereafter “Town”) in view of Birks et al (U.S. Patent

Art Unit: 2828

Application Publication 2002/0122644, hereafter '644) and further in view Bise et al (U.S. Patent 6,826,342, hereafter '342).

Claim 35: Town and '644 teach the source as claimed in claim 21. They do not explicitly teach the micro-structured fiber has a hole-to-hole pitch greater than 2.5 microns. However, '342 teaches a micro-structured fiber with a hole-to-hole pitch greater than 2.5 microns (col. 3, lines 20-21) in order to modify the dispersion characteristics of the micro-structured fiber (col. 3, lines 6-9). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a micro-structured fiber with a hole-to-hole pitch greater than 2.5 microns in order to modify the dispersion characteristics of the micro-structured fiber.

Claim 37: Town, '644 and '342 teach the source of claim 35. '342 teaches the micro-structured fiber includes a cladding region comprising an array of holes of diameter  $d$  (col. 3, lines 19-21,  $d=2.4\mu\text{m}$ ) and hole-to-hole pitch  $\Lambda$  (col. 3, lines 19-22,  $\Lambda=4.3\mu\text{m}$ ), in which  $d/\Lambda$  is less than 0.7 ( $d/\Lambda=2.4/4.3=.558$ ).

### ***Conclusion***

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Art Unit: 2828

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK STAFFORD whose telephone number is (571)270-1275. The examiner can normally be reached on M-Th 7:30-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. S./

Examiner, Art Unit 2828

/Minsun Harvey/

Application/Control Number: 10/583,961

Page 9

Art Unit: 2828

Supervisory Patent Examiner, Art Unit 2828